Stage 1: Desired Results

Enduring Understanding

- Circular motion occurs only when there is the necessary force pointed inward toward the center of the radius of the curve around which an object is traveling.

Correlations

Unifying Understanding

<table>
<thead>
<tr>
<th>VA SOL</th>
<th>PH.5.b</th>
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<th>NSES (grade level)</th>
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| AAAS Atlas |

Essential Questions

- What causes an object to travel in a circular path?
- Under what circumstances would travel in a circular path not be possible?

Knowledge and Skills

Students should know:

- The differences between real and fictitious forces and be able to apply that to circular motion.
- The difference between centripetal force and inertial effects;

Students should be able to:

- Analyze a variety of situations to determine whether or not circular motion will occur.
- Solve problems involving circular motion.

Stage 2: Assessment Evidence

Prior Knowledge and Skills

- Things traveling in a curved path feel pushed outward by something.

Formative Assessment

- Lab experiences

Summative Assessment

- End of unit cumulative assessment
## Stage 3: Learning Plan

### References to Adopted Materials
- See textbook correlations below

### Suggested Investigations
- Have students “discover” that the centripetal force required for uniform circular motion varies as the square of the velocity experimentally.
- Calculate the peak static friction force, and then the coefficient of static friction for an object spinning on a record player turntable.

### Outdoor Education Applications
- None currently noted

### Resources

#### Web Sites
- http://xkcd.com/123/

#### Videos
- None currently noted

#### Online clips
- None currently noted

#### Field Trips
- None currently noted

#### Other
- None currently noted
<table>
<thead>
<tr>
<th>Topic</th>
<th>Intensified Physics</th>
<th>Regular Physics</th>
<th>Principles of Physics</th>
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<tbody>
<tr>
<td>Circular Motion Applications</td>
<td>Cutnell &amp; Johnson <em>Physics</em>, Ch 5.3-8</td>
<td>Hsu, <em>Foundations of Physics</em>, Ch 8.3</td>
<td>Hsu, <em>Physics – A First Course</em>, Ch 6.3</td>
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